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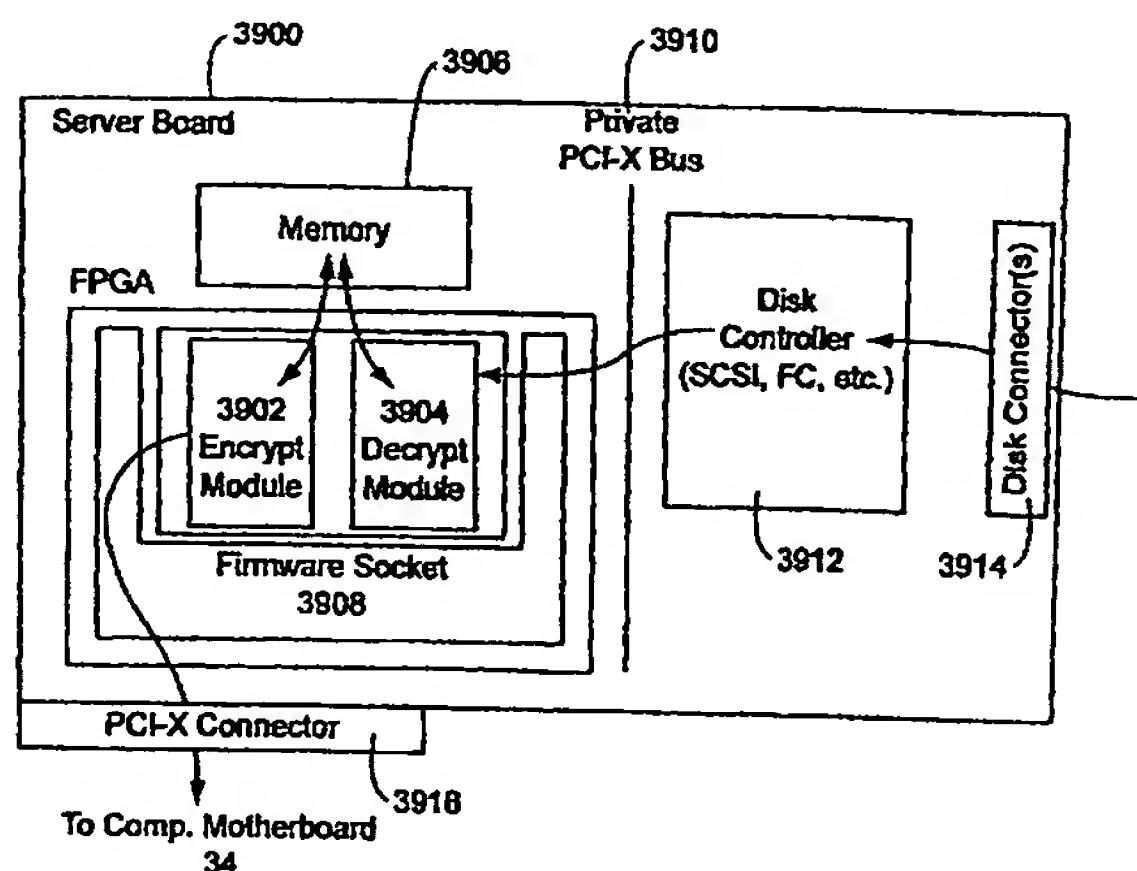
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[Continued on next page]

(54) Title: INTELLIGENT DATA STORAGE AND PROCESSING USING FPGA DEVICES



(57) Abstract: A data storage and retrieval device and method is disclosed. The device includes at least one magnetic storage medium configured to store target data and at least one re-configurable logic device comprising an FPGA coupled to the at least one magnetic storage medium and configured to read a continuous stream of target data therefrom, having been configured with a template or as otherwise desired to fit the type of search and data being searched. The re-configurable logic device is configured to receive at least one search inquiry in the form of a data key and to determine a match between the data key and the target data as it is being read from the at least one magnetic storage medium. This device and method can perform a variety of searches on the target data including without limitation exact and approximate match searches, sequence match searches, image match searches and data reduction searches. This device and method may be provided as part of a stand-alone computer system, embodied in a network attached storage device, or can otherwise be provided as part of a computer LAN or WAN. In addition to performing search and data reduction operations, this device may also be used to perform a variety of other processing operations including encryption, decryption, compression, decompression, and combinations thereof.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/016021

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 887 723 A (INTERNATIONAL BUSINESS MACHINES CORPORATION) 30 December 1998 (1998-12-30) abstract column 3, line 7 - column 8, line 18 figure 1	1-23
A	----- US 5 943 421 A (GRABON ET AL) 24 August 1999 (1999-08-24) abstract column 6, line 45 - line 63 column 7, line 48 - line 64 column 9, line 39 - line 50 figures 2,3b ----- -/--	4,11

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

6 April 2005

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18. 08. 2005

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/016021

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 880 088 A (MITSUBISHI CORPORATION) 25 November 1998 (1998-11-25) column 14, line 2 - line 58 column 15, line 19 - line 31 column 8, line 41 - column 10, line 7 figures 2,3,5 -----</p>	1-23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/016021

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-23

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-23

securing the decryption step

2. claims: 24-44

search acceleration

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/016021

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